UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,064	07/01/2003	Donald J. Curry	117299	3501

7590 02/22/2008

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER	
DHINGRA, PAWANDEEP	
ART UNIT	**PAPER NUMBER**
2625	

MAIL DATE	DELIVERY MODE
02/22/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/612,064	CURRY ET AL.	
	Examiner	Art Unit	
	Pawandeep S. Dhingra	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-6, 8, 11-20* is/are rejected.

7)☐ Claim(s) *7,9 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

- This action is responsive to the following communication: Amendment after non-final rejection filed on 11/30/2007.
- Claims 1-20 are pending in the present application.

Response to arguments

Applicant's arguments, see pages 7-9, filed 11/30/2007, with respect to the rejection(s) of independent claim(s) 1, 11, and 17 under Fan in view of Cheung have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made under Fan in view of Cheung further in view of Okuda et al.

Examiner Notes

Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 5-6, 8, 11 and 17 are rejected under 35 U.S.C. 103 as being unpatentable over Fan et al., US 6,839, 152 in view of Cheung et al., US 6,222,945 further in view of Okuda et al., US 6,493, 467.

Re claim 1, Fan et al. discloses a method for de-screening an image signal (see abstract), the method comprising the operations of: (a) determining a control signal (i.e. image signal from element 32 in figure 3) to select a pair of filters (elements 36 and 38 in figure 3); (b) selecting a pair of filters (elements 36 and 38 in figure 3); (c) filtering the image signal (i.e. signal from halftone image buffer, see element 32 in figure 3) using the selected pair of filters (low pass filter and notch filter, see figure 3) to produce a pair of filter output signals (see figure 3); (d) generating at least one first control signal (element 42 in figure 3) based on the image signal (element 32 in figure 3) using a control module (i.e. low pass filter, figure 3); and (e) dynamically blending the selected pair of filter output signals (element 46a and 46b) in accordance with the first control signal (element 42 in figure 3) to produce a de-screened output signal, using a blend module (i.e. element 48 in figure 3) (see figure 3).

Fan et al. fails to disclose selecting filters from a bank of filters using the determined control signal; and wherein the pair of filters is selected based on a top three bits of a signal generated from the determined control signal.

However, Cheung et al. discloses that the bank of filters (i.e. filter set 25, fig. 2) and selecting filters from a bank of filters using the determined control signal (see figures 2, 9; abstract, column 2, line 65 - column 3, line 62; column 8, lines 25-column 10, line 33; claims 1-7).

Okuda et al. discloses the pair of filters is selected based on a top three bits of a signal generated from the determined control signal (see column 22, lines 52-60; column 23, lines 7-19, lines 42-46; column 42, line 54-column 43, line 8, note that a filter set is selected from a plurality of filter sets for image processing based on the 4-bits signal generated by the filter selection signal. Further note that it is apparent the 4-bit filter selection signal includes the top three bits, hence the filter set is selected based on the top three bits plus the fourth bit of a signal generated by the determined control signal). [Note: if selecting the pair of filters was based on only top three bits, than that would further limit the claims].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the filtering method for de-screening scanned images as disclosed by Fan to include the method of selective filtering of dithered image as taught by Cheung, and filter selection techniques as taught by Okuda in order to select filters (low-pass filters) from the bank of filters (filter set)

of Cheung, and use each selected filter according to a desired selection criteria (as taught by Okuda) as a selected pair of filters in the system of Fan for the benefit of selecting a filter which better fulfills the desired need of the user and to utilize a *"method of inverse dithering that is substantially less computationally complex and requires less memory resources than those of methods presently utilized"* as taught by Cheung at column 2, lines 39-42, and *"to provide a data processing apparatus enabling a reduction of the development period of a filtering apparatus and a method of the same"* as taught by Okuda at column 3, lines 50-53.

Re claim 5, Fan fails to disclose that the bank of filters comprises lowpass filters having different cutoff frequencies to facilitate reduction of different halftone screen frequencies occurring within a predetermined range.

However, Cheung et al. discloses that the bank of filters (i.e. filter set 25) comprises lowpass filters (see column 4, lines 66-67) having different cutoff frequencies (see column 6, lines 26-29) to facilitate reduction of different halftone screen frequencies occurring within a predetermined range (see column 1, lines 26-37 & column 3, lines 1-12, note that digital filters are ordered in increasing cutoff frequency in order to have the object edges or the high-frequency content of the original image to be maintained without undesirable blurring).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the filtering method for de-screening scanned images as disclosed by Fan to include the method of selective filtering of dithered image as taught by Cheung, and filter selection techniques as taught by

Okuda in order to select filters (low-pass filters) from the bank of filters (filter set) of Cheung, and use each selected filter according to a desired selection criteria (as taught by Okuda) as a selected pair of filters in the system of Fan for the benefit of selecting a filter which better fulfills the desired need of the user and to utilize a *"method of inverse dithering that is substantially less computationally complex and requires less memory resources than those of methods presently utilized"* as taught by Cheung at column 2, lines 39-42, and *"to provide a data processing apparatus enabling a reduction of the development period of a filtering apparatus and a method of the same"* as taught by Okuda at column 3, lines 50-53.

Re claim 6, Fan fails to disclose a number of filters having different filter spans and cascaded in series with one of the filters having a large filter span in the array of filters to produce a super lowpass signal having lowest cutoff frequency.

However, Cheung further discloses a number of filters having different filter spans and cascaded in series with one of the filters having a large filter span in the array of filters to produce a super lowpass signal having lowest cutoff frequency (see column 4, line 66 – column 5, line 4, column 6, lines 12-29, note that the filter of lowest index will produce the low pass signal having lowest cutoff frequency).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the filtering method for de-screening scanned images as disclosed by Fan to include the method of selective filtering of

dithered image as taught by Cheung, and filter selection techniques as taught by Okuda in order to select filters (low-pass filters) from the bank of filters (filter set) of Cheung, and use each selected filter according to a desired selection criteria (as taught by Okuda) as a selected pair of filters in the system of Fan for the benefit of selecting a filter which better fulfills the desired need of the user and to utilize a *"method of inverse dithering that is substantially less computationally complex and requires less memory resources than those of methods presently utilized"* as taught by Cheung at column 2, lines 39-42, and *"to provide a data processing apparatus enabling a reduction of the development period of a filtering apparatus and a method of the same"* as taught by Okuda at column 3, lines 50-53.

Re claim 8, Fan further discloses receiving, via an interpolation unit (see figure 3) included in the blend module (see figure 3), the filter output signals (see two signals going into elements 36 and 38, figure 3) and the first control signal (see signal going into element 42, figure 3); blending two signals selected from the filter output signals in accordance with the first control signal (see element 48, figure 3), via the interpolation unit; and producing a blended output signal (see figure 3).

Regarding claims 11, and 17, they are interpreted and thus rejected for the reasons set forth above in the rejection of claim 1, since claims 11, and 17 disclose an apparatus, and an article of manufacture with program code for carrying out the method that corresponds to the method of de-screening an image signal of claim 1, thus the apparatus is inherent and it simply provides

structural implementation for the functionality found in image de-screening method claim 1.

Re claims 15 and 16, claims 15-16 recites identical features, as claims 5-6, except claims 15-16 are an apparatus claims. Thus, arguments made for claims 5-6 are applicable for claims 15-16.

3. Claims 2-4, 12-14, and 18-20 are rejected under 35 U.S.C. 103 as being unpatentable over Fan et al., US 6,839, 152 in view of Cheung et al., US 6,222,945 further in view of Okuda et al., US 6,493, 467 further in view of Acharya, US 6,725,247.

Re claim 2, Fan fails to further disclose the bank of filters comprises two-dimensional filters, each of the two-dimensional filters being separable into two one-dimensional filters

However, Acharya further discloses, the bank of filters comprises two-dimensional filters (see abstract), each of the two-dimensional filters being separable into two one-dimensional filters (see column 5, lines 4-35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the filtering method for de-screening scanned images as disclosed by Fan to include the method of selective filtering of dithered image as taught by Cheung, filter selection techniques as taught by Okuda, and the pyramid filter architecture as taught by Acharya for the benefit of utilizing a *"method of inverse dithering that is substantially less computationally*

complex and requires less memory resources than those of methods presently utilized" as taught by Cheung at column 2, lines 39-42, *"to provide a data processing apparatus enabling a reduction of the development period of a filtering apparatus and a method of the same"* as taught by Okuda at column 3, lines 50-53, and "to generate different blurred images in parallel from a single source image" as taught by Acharya at column 1, lines 53-55.

Re claim 3, Fan fails to further disclose each of the one-dimensional filters has a symmetric triangular shape with integer coefficients

However, Acharya further discloses that each of the one-dimensional filters has a symmetric triangular shape (i.e. 3x3 filter) with integer coefficients (see column 1, lines 56-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the filtering method for de-screening scanned images as disclosed by Fan to include the method of selective filtering of dithered image as taught by Cheung, filter selection techniques as taught by Okuda, and the pyramid filter architecture as taught by Acharya for the benefit of utilizing a *"method of inverse dithering that is substantially less computationally complex and requires less memory resources than those of methods presently utilized"* as taught by Cheung at column 2, lines 39-42, *"to provide a data processing apparatus enabling a reduction of the development period of a filtering apparatus and a method of the same"* as taught by Okuda at column 3, lines 50-53, and "to

generate different blurred images in parallel from a single source image" as taught by Acharya at column 1, lines 53-55.

Re claim 4, Fan fails to further disclose some of the one-dimensional filters has a total weight equal to a power-of-2 number, the total weight being the sum of respective coefficients

However, Acharya further discloses that some of the one-dimensional filters has a total weight equal to a power-of-2 number, the total weight being the sum of respective coefficients (see abstract & column 3, lines 34-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the filtering method for de-screening scanned images as disclosed by Fan to include the method of selective filtering of dithered image as taught by Cheung, filter selection techniques as taught by Okuda, and the pyramid filter architecture as taught by Acharya for the benefit of utilizing a *"method of inverse dithering that is substantially less computationally complex and requires less memory resources than those of methods presently utilized"* as taught by Cheung at column 2, lines 39-42, *"to provide a data processing apparatus enabling a reduction of the development period of a filtering apparatus and a method of the same"* as taught by Okuda at column 3, lines 50-53, and "to generate different blurred images in parallel from a single source image" as taught by Acharya at column 1, lines 53-55.

Regarding claims 12-14, and 18-20, they are interpreted and thus rejected for the reasons set forth above in the rejection of claims 2-4, since claims 12-14, and 18-20 disclose an apparatus, and an article of manufacture with program code for carrying out the method that corresponds to the method of de-screening an image signal of claims 2-4, thus the apparatus is inherent and it simply provides structural implementation for the functionality found in image de-screening method claims 2-4.

Allowable Subject Matter

Regarding claims 7, and 9-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not disclose, teach, or suggest the claimed inventions of (in combination with all other limitations in the claims), first control signal including information regarding which of the filter output signals are to be blended and the proportion of blending as set forth in claim 7.

The chrominance processing and un-sharped masked filter included in the blend module for producing the sharpened output signal as set forth in claim 9. Claim 10 is dependent upon claim 9 and further limits the claimed invention.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pawandeep S. Dhingra whose telephone number is 571-270-1231. The examiner can normally be reached on M-F, 9:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler Lamb can be reached on 571-272-7406. The fax

phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Pd
February 18, 2008

TWYLER LAMB HASKINS
SUPERVISORY PATENT EXAMINER